

APPENDIX 1 ENVIRONMENTAL INDICATORS

Environmental indicators provide an objective assessment on the state of the environment and overall environmental improvement along the border. In this report, each of the nine Border XXI Workgroups has provided an update on the status of the binational environmental indicators presented in the 1997 United States-Mexico Border Environmental Indicators Report.

The indicators presented in each workgroup chapter are defined according to the United Nations Organisation for Economic Cooperation and Development (OECD) framework for organizing indicators. A tab above each indicator denotes which of the three categories a particular indicator falls into. Each indicator is categorized as a pressure, state, or response indicator as defined below.

PRESSURE INDICATORS Pressure indicators are measures of pressure on the environment caused by human activities. An example is the amount of pollutant loading on surface or subsurface waters by a given industry or process.

State indicators are measures of the quality of the environment and the quantity of natural resources, and include the health effects on human populations and ecosystems caused by the deterioration of the environment. An example is the concentration of a particular chemical in surface or subsurface waters. Unlike the pressure indicator example above, which measures the amount of pollution loading, a state indicator captures the concentration of a pollutant in surface or subsurface water.

RESPONSE INDICATORS Response indicators are measures of the efforts undertaken by society to respond to environmental changes and issues. An example is the amount of alternative chemicals substituted for water polluting substances in a particular industry or process.

Using the OECD model allows the workgroups to evaluate environmental and human health conditions under a consistent methodology to better determine the best strategies for addressing environmental and human health issues along the border. As more data are collected and analyzed, the indicators will be presented in a manner that integrates pressure, state, and response indicators and their impact on human health. In addition, future environmental indicator reports will present an analysis and interpretation of environmental indicator trends.

APPENDIX 2 HISTORY OF U.S.-MEXICO COOPERATION ON NATURAL RESOURCES ISSUES

- The 1936 Convention between the United States and Mexico on the Protection of Migratory Birds and Game Mammals enabled the two governments to work together to protect migratory birds and shorebirds by implementing hunting regulations; creating reserves; and conducting annual, binational reconnaissance and aerial surveys of major wetlands in Mexico and the United States.
- The Trilateral Committee for Wildlife Conservation of the United States, Mexico, and Canada was created in 1994 to bring together top officials, scientists, and resource managers representing wildlife agencies of all three countries to collaborate on biodiversity conservation issues.
- Other notable conservation efforts have been conducted under the 1988 Agreement on the Conservation of Wetlands and their Migratory Birds and the 1994 North American Waterfowl Management Plan. Under these agreements, the U.S. Fish and Wildlife Service participates in partnerships established in important wetlands regions of the three countries.
- The U.S. National Park Service and Mexico's Instituto Nacional de Ecología (INE, or National Institute of Ecology) signed a memorandum of understanding (MOU) in 1988 for technical exchange and cooperation in the fields of conservation and management for national parks and protected areas.
- The MOU between the U.S. Department of the Interior (DOI) and Mexico's Secretaría de Medio Ambiente, Recursos Naturales, y Pesca (SEMARNAP, or Secretariat of the Environment, Natural Resources and Fisheries) concerning scientific and technical cooperation on biological data and information was signed in 1995 to exchange biological data and information networks needed to support the conservation, sound management, and sustainable use of biological resources.
- In 1996, the U.S. Geological Survey and Mexico's Instituto Nacional de Estadística, Geografía, e Informática (INEGI, or National Institute of Statistics, Geography, and Information) signed Annex II of an existing MOU to begin an aerial photography initiative along the U.S.-Mexico border. The initiative will support digital mapping efforts and the integration of geographic information systems and data for geospatial analysis for both sides of the border. The data will contribute to more effective and efficient decision making in areas such as the environment, geology and hydrology studies, waste disposal, land use planning, and pollution and disaster responses.
- The 1997 Letter of Intent between DOI and SEMARNAP for Joint Work in Natural Protected Areas on the U.S.-Mexico Border expanded existing cooperative activities in the conservation of shared border ecosystems and habitats.
- In May 1997, the U.S. Department of Agriculture (USDA) and SEMARNAP signed an MOU that pledged cooperation in forestry and natural resources conservation. The MOU updated a long-standing cooperative partnership between USDA and Mexico's dissolved Secretaría de Agricultura y Recursos Hidráulicos (SARH, or Secretariat of Agriculture and Water Resources. The SARH was replaced by the current Secretaría de Agricultura, Ganadería y Desarrollo Rural (SAGAR, or Secretariat of Agriculture, Livestock, and Rural Development) and the Comisión Nacional del Agua [CNA, or National Water Commission]). The MOU identified areas of cooperation in sustainable forest management, soil conservation, and restoration issues.

APPENDIX 3

U.S.-MEXICO BUSINESS AND TRADE COMMUNITY: THE SEVEN PRINCIPLES OF ENVIRONMENTAL STEWARDSHIP FOR THE 21ST CENTURY

In furtherance of the goals of the Border XXI Environmental Framework, these Principles have been developed through a public/private partnership to promote sustainable development in the U.S.-Mexico border area;

In recognition of the objectives of the North American Agreement on Environmental Cooperation to: foster environmental protection and improvement throughout North America for the well-being of present and future generations; promote sustainable development; enhance environmental compliance; promote economically efficient and effective environmental measures; and promote pollution prevention;

In recognition of existing obligations to comply with domestic environmental laws;

The signatories below will work together, and in conjunction with other federal and state government agencies and industry representatives, to promote voluntary implementation of the following Principles of Environmental Stewardship by corporate entities and their affiliates throughout the United States and Mexico, at all of their operational locations, consistent with the domestic laws of each country:

1. TOP MANAGEMENT COMMITMENT: Make substantive top management commitments to sustainable development and improved environmental performance through policies that emphasize pollution prevention, energy efficiency, adherence to appropriate international standards, environmental leadership, and public communications.

2. COMPLIANCE ASSURANCE AND POLLUTION PREVENTION: Implement innovative environmental auditing, assessment and improvement programs to identify and correct current and potential compliance problems and utilize pollution prevention and energy efficiency measures to improve overall environmental performance.

3. ENABLING SYSTEMS: Through open and inclusive processes, develop and foster implementation of environmental management systems which provide a framework for ensuring day-to-day compliance in process operations, pollution prevention, energy efficiency, and improved environmental performance. Encourage the use of environmental audits, pollution prevention assessments, and employee training and involvement as integral parts of the company's culture at home and abroad.

4. MEASUREMENT AND CONTINUOUS IMPROVEMENT: Develop measures of environmental performance to demonstrate adherence to these Principles. Periodically assess the progress toward meeting the organization's environmental goals and tie results to actions in improving environmental performance.

5. PUBLIC COMMUNICATIONS: Consistent with the sovereign host country's domestic laws and policies governing environmental protection and the protection of confidential business information: voluntarily make available to the public information on the organization's environmental performances and releases, as well as on the performance of its environmental management system relative to these Principles, based on established objectives and targets; and voluntarily provide avenues for receiving suggestions from and establishing dialogue with the public about the company's environmental performance.

6. INDUSTRY LEADERSHIP: Work with other companies operating in the same region or industry sub-sector to improve industry-wide environmental compliance, pollution prevention practices, energy efficiency, and overall environmental performance. For example, explore cooperative strategies such as by-product synergy, joint industry subsector efforts, or technical assistance to smaller enterprises, including the implementation of environmental audits.

7. COMMUNITY ENVIRONMENTAL STEWARDSHIF Promote and give support to environmental stewardship and sustainable development in the community in which the organization operates, for example, through investments in local environmental infrastructure, health, education, and improving public environmental awareness.

SIGNATORIES:

The Honorable Carol Browner, Administrator
The United States Environmental Protection Agency

May 28, 1999

The Honorable Julia Carabias, Secretary

June 4, 1999

Mexican Secretariat of the Environment, Natural Resources, and Fisheries

Albert C. Zapanta, President

June 4, 1999

The United States-Mexico Chamber of Commerce

Javier Cabrera Bravo, General Manager

June 4, 1999

The Border Environment Cooperation Commission

APPENDIX 4 U.S.-MEXICO BORDER XXI BINATIONAL REGIONAL SUBWORKGROUPS AND MAJOR BORDER-WIDE INITIATIVES

WORKGROUP

SUBWORKGROUP OR INITIATIVE

Air

- Paso Del Norte Joint Advisory Committee*
- Binational Ambos Nogales Subworkgroup
- Binational Douglas/Agua Prieta Subworkgroup
- Energy and Air Quality Subworkgroup
- Border Congestion Subworkgroup
- Mexico Emission Inventory Methodology Advisory Council
- Binational California/Baja California Subworkgroup
- El Paso-Ciudad Juárez-Sunland Park Subworkgroup
- * This group was created under the La Paz Agreement and has been incorporated into the architecture of the Border XXI Program.

Contingency Planning and Emergency Response

No subworkgroups (as of date of publication)

Cooperative Enforcement and Compliance

- Binational California-Baja California Subworkgroup
- Binational Arizona-Sonora Subworkgroup
- Binational Texas-New Mexico-Chihuahua Subworkgroup
- Binational Texas-Coahuila Subworkgroup
- Binational Texas-Nuevo León-Tamaulipas Subworkgroup

Environmental Health

- Pesticide Exposure and Health Effects on Children Initiative
- Pediatric Lead (Pb) Exposure Initiative
- Geographic Information Systems (GIS) Initiative
- Health Alerts and Communication Initiative
- Neural Tube Defects (NTD) Surveillance Initiative
- Advanced Training Initiative
- Toxicology Center Development Initiative

WORKGROUP

Environmental Information

SUBWORKGROUP OR INITIATIVE

- GIS/Geospatial Subworkgroup (This group is inactive until the U.S. Environmental Protection Agency [EPA] and Mexico's Secretaría de Medio Ambiente, Recursos Naturales, y Pesca [SEMARNAP, or Secretariat of the Environment, Natural Resources, and Fisheries] can identify a Mexican co-chair and committee representative. In the interim, mapping and GIS activities are being coordinated by the U.S. Geological Survey [USGS] and Mexico's Instituto Nacional de Estadística, Geografía, e Informática [INEGI, or National Institute of Statistics, Geography, and Information].)
- Data Exchange and Release of Information Subworkgroup

Hazardous and Solid Waste

- Binational California-Baja California Subworkgroup
- Binational Arizona-Sonora Subworkgroup
- Binational Texas-New Mexico-Chihuahua Subworkgroup
- Binational Texas-Coahuila Subworkgroup
- Binational Texas-Nuevo León-Tamaulipas Subworkgroup

Natural Resources

California-Baja California Subworkgroup

Pollution Prevention

No subworkgroup (as of date of publication)

Water

No subworkgroup (as of date of publication)

APPENDIX 5

U.S. ENVIRONMENTAL PROTECTION AGENCY RESOURCE COMMITMENTS AND CONSTRAINTS

In both the United States and Mexico, funding at the federal level for implementation of border initiatives is provided through annual appropriations. For the United States, funding for the U.S. Environmental Protection Agency (EPA)¹ is an important component of the overall budget for border activities, although many other agencies, including the U.S. Departments of the Interior, Health and Human Services, and State, also have border-related appropriations. The states also budget for border-related activities, as do many tribes and municipalities, although, in many such cases, the origin of resources is a federal agency (as is the case for EPA grants for infrastructure revolving funds operated by the states for water-relat-

ed projects).

The 1996 U.S.-Mexico Border XXI Program: Framework Document (Framework Document) provided quantitative information about EPA budgets for border needs for the period 1995 to 1997. In this appendix, figures are provided for the period 1994 to 2000 to provide a longer perspective.

The *Framework Document* also addressed other areas, including funding for the North American Development Bank (NADB) and EPA's water infrastructure funding. Developments in those areas are also included in this appendix.

The trend over the period 1994 to 2000 has been toward smaller total appropriations for border funding, represented by the 1995 high of more than \$175 million and the 1999 low of some \$73 million—a difference of more than \$100 million. The full-time-equivalent, or FTE, allocated for EPA border staff has also been on a downward trend, although the level of FTE does not track closely with funding levels. Figure 1 shows those trends.

The bulk of EPA border funding during the period 1994 to 2000 was for state and tribal assistance grants, largely for construction of infrastructure projects in the United States and Mexico. Those funds are administered cooperatively with the states and tribes and, since 1997, through the Border Environment Cooperation Commission (BECC) and NADB for water-related funds (see Figure 2 for a

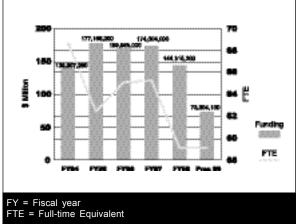


Figure 1

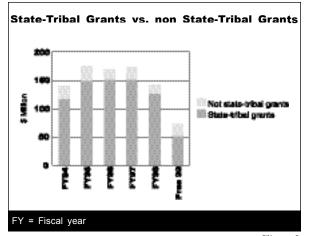


Figure 2

comparision of state and tribal grants with non-state and tribal grants). EPA has provided \$20 million in grants to the BECC for technical assistance to projects seeking certification. The agency partners with NADB to administer \$211 million in funds for the construction of BECC-certified projects. While the sums are considerable, so is the need: municipal infrastructure is among the most costly investments any government makes, and construction is the principal front-end cost. EPA grant funds have been invested in more than a dozen infrastructure projects in the United States and Mexico, such as the first-ever wastewater plants in Ciudad Juárez, scheduled for completion in 2000. The total population served by projects built or under construction through the BECC and NADB is more than 7 million.

It is worthwhile to note that there is very limited discretion on EPA's part in the administration of the funds once they

All figures in this appendix are drawn from official EPA and congressional sources, with the exception of the figures in Figure 5, which are taken from the U.S.-Mexico Border Ten-Year Outlook: Environmental Infrastructure Funding Projections, 1999, North American Development Bank.

have been appropriated. For example, the \$50 million (1999) for water construction could be used only for designing and building drinking-water and wastewater projects. Once those projects have been completed, the funds cannot be used to operate and maintain the water projects themselves.

FUNCTIONAL AREAS Although the bulk of funding for the border is for water infrastructure grants, EPA carries out activities in other areas (see Figure 3). After water activities, air- and wasterelated activities receive the most funding. All other areas are combined in Figure 4. Clearly, water funding predominates; there appears to be a downward trend over the period 1994 to 2000, as well. Much of the non-water-related funding is also in the form of state and tribal assistance grants; typically, the administration of funding is carried out by governments (or organizations, in the case of the BECC and NADB) other than the federal government. These resources, again, are not fungible; that is, they are designated appropriations for a specific purpose, often a media-specific purpose, and cannot be substituted or transferred for use elsewhere. When the non-water areas are considered separately from water-related projects, the trend is still somewhat erratic, with the overall total ranging from \$20 to \$25 million, and with individual components varying from year to year.

water funding water funding has been described above, the funds' large proportion of EPA resources merit mention of two additional points. First, water grants are used to leverage, or generate, additional funds from other sources—either other grants or private capital, or some combination of the two.

Second, the need to address existing and projected demand for basic infrastructure is immense. In 1999, NADB prepared a 10-year forecast of needs, largely for its core water-related functional areas. Figure 5 contrasts the downward trend in grant funds with the steady demand forecast by the NADB study.

The projected demand described above with regard to infrastructure is to some degree representative of other growing needs of the border and its communities, which face serious demand for

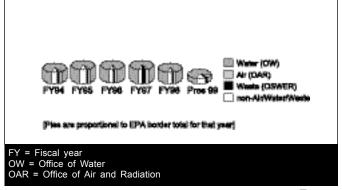


Figure 3

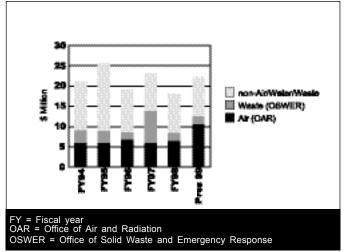


Figure 4

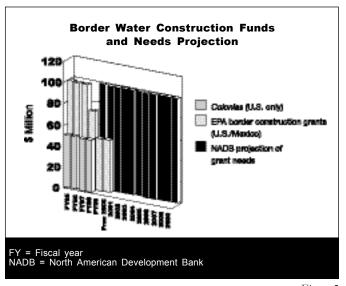


Figure 5

services and programs besides infrastructure works. While EPA's resources are considerable, the population is large and growing. Conservative estimates indicate that the border population will double over the next 20 years. Governments, the private sector, and other organizations continue to face a challenge in bringing adequate resources to bear to address border concerns.

APPENDIX 6 U.S. ENVIRONMENTAL PROTECTION AGENCY BORDER LIAISON OFFICES: OUTREACH TO THE PUBLIC SECTOR

To achieve the public outreach and involvement objectives of the Border XXI Program, the U.S. Environmental Protection Agency (EPA) has established border liaison offices to provide environmental information to local communities and governments, nongovernmental organizations, academic institutions, and border residents. Outreach specialists in each office are available to answer questions, obtain responses, and provide a number of other types of outreach services and resources to border stakeholders.

There are two EPA border liaison offices, one in San Diego, California and one in El Paso, Texas. The San Diego Border Office (SDBO) is staffed by a director, two outreach specialists, an environmental justice specialist, and a tribal liaison. The El Paso Border Office (EPBO) staff consists of a director and three outreach specialists. Staff members from the EPBO also staff a "satellite" office in Brownsville, Texas, once a month.

Some of the services provided by the SDBO and EPBO are described below.

The border offices have established public information centers to facilitate access to environmental information for border communities. The centers provide information about the Border XXI Program, environmental and technical reports, border newspaper archives, English translations of Mexican environmental laws, and information about U.S. environmental laws and regulations and environmental grant opportunities. The public information centers also have public computer workstations with Internet access. In addition, Border XXI documents have been supplied to more than 60 repositories located in communities throughout the border region.

PUBLIC MEETINGS

The EPBO and SDBO have hosted more than 50 open houses since the inception of the Border XXI Program. For some open houses, a speaker from the community has addressed an individual topic and participated in a discussion with the audience. At other open houses, the progress of the Border XXI workgroups is discussed, and feedback is solicited from border stakeholders on workgroup projects and other Border XXI activities. The open house events serve as a means for border communities to learn more about a particular border environmental issue and for EPA staff to gain a better understanding of the concerns and desires of the community.

In addition, the SDBO has conducted four grant-writing workshops, which notify communities of EPA environmental grant opportunities and provide training to community members to better prepare them to complete the EPA grant application process.

Border office staff members frequently speak at environmental conferences and meetings of community groups on a broad range of environmental topics, as well as on the Border XXI Program.

mation fact sheets in English and Spanish have been developed and distributed. In addition to providing details about the goals, structure, and activities of each of the nine workgroups, fact sheets are available on the following topics: (1) Border XXI Program overview; (2) the EPA border liaison offices; (3) the Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADB); and (4) the Geographic Information Sys-

tem (GIS) Subworkgoup. Each of the fact sheets provides an overview of the topic, a brief description of how the topic is related to the Border XXI Program, and names and telephone numbers of contacts in both the United States and Mexico. The fact sheets are available from both border offices and on the Border XXI Program web site at www.epa.gov/usmexicoborder.

Through a cooperative agreement with ARTScorpsLA, a 50-minute bilingual education video has been developed to provide an overview of the Border XXI Program and some of the key issues confronting border communities. The video is an interlocking series of vignettes; each emphasizes important themes and ideas through pictures, text, and individual voices. The video has been distributed to border libraries, Border XXI repositories, public access television stations, and other organizations along the border. The public can contact the border offices at 800-334-0741 for more information and a copy of the video.

Water Commission (IBWC) staff to provide opportunities for the local community to dialogue with representatives from the two federal entities, as well as from the City of San Diego, and to receive progress reports regarding the planning, design, and construction of the San Diego International Wastewater Treatment Plant (IWTP) and the outfall. These collaborative efforts have included: (1) convening public monthly meetings since 1995; (2) publishing and distributing bilingual fact sheets; (3) publishing and distributing a draft and a final environmental impact reports; and (4) presenting information on the IWTP to local city and county officials.

The EPBO is involved in a number of activities related to air quality management in the Paso del Norte air basin, an area comprising Ciudad Juárez, Chihuahua; El Paso, Texas; and Doña Ana County, New Mexico. The EPBO also has been a participant in the Paso del Norte Clean Air Partnership, a multi-stakeholder group that organizes community air quality awareness programs. The group established the first binational Ozone Action Day Program, which provides timely information to the community about the potential impacts of ozone pollution and encourages Paso del Norte residents to protect themselves from ozone exposure and to take actions to reduce pollution. The Paso del Norte Ozone Map, developed under a cooperative agreement between the EPA and Austin College, and produced daily by the University of Texas, El Paso, is an important public education tool as part of the Ozone Action Day Program. The EPA has also supported development of bilingual Internet web sites for the Paso del Norte Ozone Map (www.ozonemap.org) and Clean Air Partnership web site (www.bordercleanair.org).

In addition, the EPBO has been involved with the Joint Advisory Committee (JAC) for the Improvement of Air Quality in the Paso del Norte Air Basin. The JAC was established through Appendix I of Annex V to the La Paz Agreement as an advisory committee to the Border XXI Air Work Group to recommend actions to manage air quality in the binational region. The EPBO played a coordination role in the development of the JAC's strategic plan. The plan documents 26 priority projects identified from the more than 100 initially proposed to improve air quality in the Paso del Norte region. For more details on the JAC, please refer to the Air Workgroup chapter in this report.

OUTREACH TO INDUSTRY The EPA border liaison offices have conducted several outreach activities to industry in the border region. More specifically, the border liaison offices have:

 Provided Border XXI Program information to border industries and industry associations, through mass mailings, public meetings, listservs, meetings with industry representatives, and booths at seminars and conferences.

- Assisted in the coordination of seminars and workshops.
- Participated in industry seminars and workshops offered by the EPA and Mexico's Secretaría del Medio Ambiente, Recursos Naturales, y Pesca (SEMARNAP, or Secretariat of the Environment, Natural Resources, and Fisheries).
- Coordinated and participated in environmental education activities with the industry sector.
- Provided presentations to industry groups and organizations.

In addition to these specific activities, the EPA border liaison offices are available to respond to general questions and requests for assistance, as needed. Details about additional activities related to industry outreach can be found in the Pollution Prevention Workgroup chapter in this report.

APPENDIX 7 ECONOMIC RESOURCES FROM MEXICO APPLIED TO BORDER XXI¹

As illustrated throughout the document, a principal limiting factor confronted by Mexico was the lack of allocated funding for the Border XXI Program. All agencies, except for the *Comisión Nacional del Agua* (CNA, or National Water Commission), which receives annual funding invested specifically for the border region, used their own budgets.

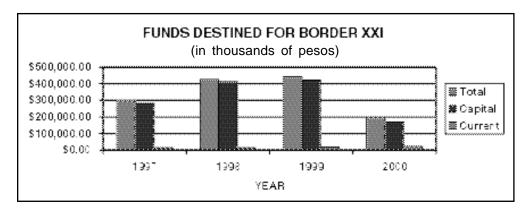
Notwithstanding the aforementioned and considering that the next phase of the program may have its own funding, the following budget quantification exercise was made by various institutions that took part in the program from 1997 to 2000.

The funds exhibited in this exercise are divided into two categories, in accordance with their Classification by Purpose of Expense, and updated by the *Secretaría de Hacienda y Crédito Público* (Treasury Ministry) in May 1992:

The term *Current Expenditures* refers to disbursements of goods, services, and other miscellaneous expenditures incurred by federal government agencies to pay for general and operational costs related to such expenses as wages and benefits; travel and per diem expenses; administrative and operational expenses; office expenses; publications; chemicals; fuel; and other expenses.

The term *Capital Expenditures* refers to all disbursements in goods, services, and other miscellaneous costs intended to increase the capacity of administrative or productive operations of the federal government agencies, which are reflected in an increase of their capital or the aggregate of their fixed assets, including: technology equipment; construction equipment; sundry equipment and machinery; vehicles; laboratory equipment; research, seminar workshops, and consultations; public works; and more.¹

The figure below shows the estimated amount of funds budgeted for the Border XXI Program annually during the 1997–2000 period. For 2000, the amount represents the budgeted funds.



As can be seen, the capital expense component is much larger than the current expense component, reflecting the investments that CNA and the states and municipalities made within the water group.

The figure on the following page shows the funds that were applied for each Border XXI component,

divided according to the two aforementioned categories, with an additional heading for institution-building that has been operated by the Instituto Nacional Ecología (INE, or National Institute of Ecology) within the framework of the Northern Border Environmental Program. Said program represents an environmental project for the region, based on a credit by the World Bank, and by federal, state and municipal funds functioning as a credit counterpart. Some of the activities financed with these funds include: personnel training, provision of equipment for the control and prevention of environmental pollution, and specific studies for the development of an environmental management strategy.

All figures shown, with the exception of the components pertaining to Capital Expense of the Water and Institution-Building Group, have been calculated specifically for this exercise and do not have official validity.

DISTRIBUTION OF FUNDS BY WORK GROUP AND PAFN ** OF BORDER XXI 1997–2000

(THOUSANDS OF PESOS)

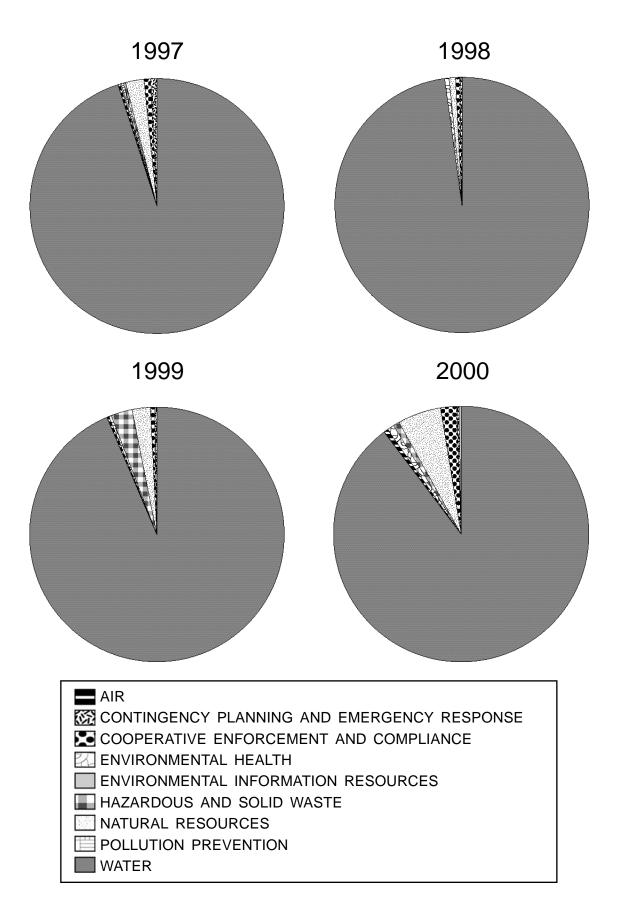
Government Agency	Workgroup	Туре	Type of Expense 1997		Type of Expense		1998
		Current	Capital	Total	Current	Capital	Total
INE	Air	615.13	90.00	705.13	615.13	90.00	705.13
Ministry of Health	Environmental Health	778.00		778.00	1,364.50		1,364.50
INE	Pollution Prevention	205.04	30.00	235.04	205.04	30.00	235.04
INE	Hazardous Wastes	745.00		745.00	645.00		645.00
CNA*	Water	1,959.16	156,138.68	158,097.84	2,196.00	238,711.44	240,907.44
States and Municipalities	Water		90,854.00	90,854.00		128,554.00	128,554.00
Subtotal Water		1,959.16	246,992.68	248,951.84	2,196.00	367,265.44	369,461.44
PROFEPA	Law Enforcement	2,024.22		2,024.22	2,630.98		2,630.98
INE	UCANP Natural Resources	5,969.46		5,969.46	2,312.46		2,312.46
INE	DGVS Natural Resources	23.50		23.50	27.54		27.54
Subtotal National Funds		5,992.96		5,992.96	2,340.00		2,340.00
INE	Environmental Information	205.04	30.00	235.04	205.04	30.00	235.04
PROFEPA	Emergency Response	2,007.00		2,007.00	700.00		700.00
UCAI/SEMARNAP	Border XXI Coordination	598.52		598.52	562.52		562.52
INE/PAFN	Institution Building	1,488.88	34,303.41	35,792.29	3,136.95	43,816.60	46,953.55
GRAND TOTAL		14,611.95	281,326.09	295,938.04	13,901.16	411,112.04	425,013.20

 $^{^{\}star}$ The amount of funds invested by CNA for the 1997 period, including investments that were made during the period 1995-1997.

 $^{^{\}star\star}$ PAFN is the Spanish acronym for Northern Border Environmental Program

Government Agency	Workgroup	Type of Expense		1999 Type of Ex		f Expense	Expense 2000	
		Current	Capital	Total	Current	Capital	Total	
INE	Air	615.13	417.24	1,032.37	500.51	268.63	769.14	
Ministry of Health	Environmental Health	1,528.24		1,528.24	1,410.00		1,410.00	
INE	Pollution Prevention	94.67	139.08	233.75	104.13	152.25	256.38	
INE	Hazardous Wastes	1,290.00		1,290.00	1,419.00		1,419.00	
CAN	Water	2,503.44	230,267.31	232,770.75	2,753.78	86,312.00	89,065.78	
States and Municipalities	Water		167,363.83	167,363.83		66,719.00	66,719.00	
Subtotal Water		2,503.44	397,631.14	400,134.58	2,753.78	153,031.00	155,784.78	
PROFEPA	Law Enforcement	3,006.71		3,006.71	3,307.38		3,307.38	
INE	UCANP Natural Resources	8,426.69		8,426.69	9,269.36		9,269.36	
INE	DGVS Natural Resources	31.40		31.40	34.54		34.54	
Subtotal Rec. Nat.		8,458.09		8,458.09	9,303.90		9,303.90	
INE	Environmental Information	94.67	139.08	233.75	104.13	152.25	256.38	
PROFEPA	Emergency Response	854.00		854.00	939.40		939.40	
UCAI/SEMARNAP	Border XXI Coordination	829.43		829.43	912.37		912.37	
INE/PAFN	Institution Building		24,195.15	24,195.15	4,963.50	14,468.40	19,431.90	
GRAND TOTAL		18.420.37	422.521.69	440.942.06	24.778.71	168.072.53	192.851.24	

LIST OF FUNDS PROVIDED BY EACH WORKING GROUP



APPENDIX 8

BORDER COMMUNITY EMPOWERMENT AND CAPACITY BUILDING: GRANTS, INFORMATION SHARING, AND OTHER TECHNICAL ASSISTANCE

Mechanisms for empowering local communities and building local capacity can take several forms, including education/outreach, funding, technical assistance, and training. Key factors in community empowerment and improved capacity are access to accurate, credible, and timely information and participation in the decision making process.

Since the inception of the Border XXI Program, the U.S. Environmental Protection Agency (EPA) has sought to use a number of mechanisms and fora for involving and empowering local community residents; nongovernmental organizations; and tribal, state, and local governments. Since 1994, extensive outreach efforts have been underway by the Border Liaison Offices to help inform the border public about the various opportunities for their participation in the Border XXI Program. These are described in Chapter 2 and in Appendix 6 of the U.S.-Mexico Border XXI Progress Report 1996–2000.

Activities of the Environmental Information Resources Workgroup have provided multiple venues for dissemination of accurate and timely information, in both English and Spanish, including postings on the Border XXI web site, and the publication of flyers and fact sheets. These are described in the Environmental Information Resources chapter and in Appendix 6 of this report. In addition, EPA has provided resources and technical assistance to communities, nongovernmental organizations, and tribal governments, facilitating the development of extensive environmental education programs, *promotores* programs, community health projects, model recycling projects, and other efforts to serve the communities in the border region. A list of the U.S.-Mexico Border Community Grants awarded to communities in 1995 and 1997 is provided in this appendix.

Some specific examples of community empowerment and capacity-building assistance are:

- \$200,000 provided in 1999 to Naco, Arizona, for development of a Brownfields project for the redevelopment of a 260-acre agro-business site into a business center.
- \$40,000 in 1999 for expansion of the Tijuana Children's Lead Prevention Program to analyze lead exposure in children living in *Colonia* Chilpancingo, near the *Metales y Derivados* abandoned lead smelter. Part of the program includes case management for children with blood lead levels found to be over 11 micrograms per deciliter (µg/dl), including education, outreach, and pottery exchange. Case management is performed by Tijuana community health representatives who are funded and trained as part of this project.
- \$135,000 in 1998 for the Nogales Children's Health Initiative for community outreach and education to reduce exposure to air toxics and improve the respiratory health of children in Nogales, Arizona. A local team composed of health professionals, city and county school officials, business representatives, members of citizens groups and clubs, academics, and parents, was funded to work with 775 families.

- \$19,000 in 1999 to implement a lead awareness program in Nogales, Arizona, spearheaded by Healthy Families, an outreach program that provides information to families on health factors that can improve the environment in the home. The program is part of the Child and Family Resources Office, which services communities in southeast Arizona.
- \$40,000 in 1997 to Project Concern for a demonstration project in 10 colonias in Tijuana designed to increase community understanding of environmental sanitation, demonstrate simple, low-cost, techniques for water storage, and improve hygiene.

The EPA grants awarded to border communities in 1995 and 1997 are summarized below. Additional grants were awarded in 2000.

1995 BORDER COMMUNITY GRANTS

PROJECT NAME	LOCATION	SUMMARY
Cochise County-Northeast Sonora Planning Project	Cochise County, Arizona	Addressed hazard prevention and reduction through binational training of community planners. Included stakeholder participation in reviewing the county land use plan.
Ambos Nogales Environmental Action Plan	Nogales, Arizona; Nogales, Sonora	Developed a public outreach program and established an environmental information center in Nogales, Arizona, and Nogales Sonora.
Building a Kumeyaay Environmental Strategy	Campo, California; Baja California a cross-border planning mechanis	Developed of a water quality control plan to measure water quality trends, as well as sm to enhance long-range environmental protection of the natural resources on Kumeyaay/Kumiai Community reservation lands.
Environmental Priorities, Needs, and Solutions in the San Diego-Tijuana Region	San Diego-Tijuana Border Region	Established a proactive environmental planning process through public outreach. An Environmental Task Force was created, which included members of government and environmental communities.
Mariposa Community Health Center	Nogales, Arizona; Nogales, Sonora	Focused on reducing, reusing, and recycling household solid waste, including hazardous waste. Designed household solid waste program in Nogales-Nogales.

PROJECT NAME	LOCATION	SUMMARY
The state of the s		
Developing an Environmental Strategy for the Western Sonoran Desert	Western Sonoran Desert; U.SMexico Border Region	Consisted of six workshops during which participants gained an understanding of their communities' relationship to the western Sonoran Desert, exploring how the desert contributes to their quality of life and traditions.
Tijuana River Watershed Toxics Data Project	Tijuana River Watershed to facilitate transborder dialogue.	Assisted the Tijuana River Watershed Geographic Information System (GIS) Project in identifying information sources of toxics data required for GIS mapping. Developed outreach materials and activities
Environmental Plan of Los Dos Laredos	Laredo, Texas; Nuevo Laredo, Tamaulipas	Created a binational environmental plan that addressed environmentally sensitive issues between the sister cities.
AYUDA's Self Help Community A.I.R.E. Project	San Elizario, Texas	Created a long range community action environmental plan for the <i>colonia</i> area that incorporated public input through meetings, local campaigns, fairs, and a special focus on youth activities.
EIP, City of Donna, Texas	Donna, Texas	Developed a long range environmental plan that included public input and incorporation of pollution prevention practices.
Ecological Baseline Model for the U.SMexico Border	Columbus, New Mexico; Palomas, Chihuahua	Established an ecological baseline assessment in the two communities, located approximately 70 miles west of El Paso and Cuidad Juárez.
Environmental Cooperation and Community Building Along the Rio Grande	Trans-Pecos region of West Texas	Incorporated pollution prevention and natural resource conservation issues through range management and multi-stakeholder participation.
EIP for Southwest Webb County, Texas	Southwest Webb County, Texas; Laredo, Texas	Developed an overall environmental improvement plan for an area that includes three large <i>colonias</i> .

1997 BORDER COMMUNITY GRANTS

PROJECT NAME	LOCATION	SUMMARY
Fermin Calderon Elementary Nature Trail	Del Rio, Texas; Ciudad Acuña, Coahuila	Constructed a nature trail for educational and public use at the Fermin Calderon Elementary School.
Interagency Coordination, Technical Exchange, and Chemical Emergency Response	San Diego, California; Tijuana, Baja California	Offered four different levels of training courses for firefighters and first responders in how to respond to chemical spills and other emergencies.
Water Protection and Hygiene Education	Tijuana, Baja California	Increased understanding of environmental sanitation, demonstrated techniques for water storage and disinfection, and improved hygiene-related behaviors.
Indoor Air Awareness Campaign	El Paso, Texas	Increased awareness of the risks associated with indoor air pollutants and provided education on prevention measures.
PROBEA: A Teacher Training Model	San Diego County, California; Tijuana, Baja California	Trained teachers in the principles of environmental education.
Border Environmental Resource Guide	California, Baja California; Arizona, Sonora	Compiled and published a Resource Guide on environmental resources and distributed the guide to all interested border communities and organizations.
AMIGO	Arizona Border Region	Brought industries together to share technologies that reduce waste and pollution and increase profits, worker safety, and health.
Colorado River Delta Restoration	Baja California, Sonora	Evaluated water quality and flows in the Colorado River wetlands and assessed wetlands and near-shore marine resources.
Nogales Community Outreach	Nogales, Arizona; Nogales, Sonora	Built community capacity for public outreach and expanded community participation in environmental and environmental health-related issues.

PROJECT NAME	LOCATION	SUMMARY
Rio Grande Watershed Mobile Exhibit	Hidalgo and Cameron counties, Texas	The grantee is producing a mobile exhibit focused on the Rio Grande watershed. The exhibit and associated materials will be presented to elementary schools.
Borderplex Environmental Center	Cameron, Hidalgo, and Willacy counties, Texas; Matamoros, Tamaulipas	Established a regional, binational education environmental center available to the public, which served as a gathering point for environmental data and information.
Pollution Prevention in Industrial Facilities in Mexico and Texas	Matamoros, Tamaulipas	Conducted an industrial source-reduction training workshop. Participants included environmental and community groups and citizens living near one or more of the chemical plants.
Agua para Beber	Webb County, Texas	Trained field workers to educate low-income residents on the safety of drinking water.
Environmental Management for Border Businesses	Border Regions of New Mexico and Texas	Improved the capabilities of border businesses to comply with environmental regulations in the United States and Mexico.

APPENDIX 9 U.S. ENVIRONMENTAL PROTECTION AGENCY TRIBAL ACTIVITIES

Region 9 of the U.S. Environmental Protection Agency (EPA Region 9) is responsible for activities in California and Arizona. EPA Region 9 been particularly active in: (1) addressing the environmental concerns of the indigenous tribes located in the border area of this region; and (2) encouraging greater tribal participation in the U.S.-Mexico Border XXI Program. Examples of EPA Region 9 support for the tribes include the following:

- In 1999, \$170,000 was allocated to enhance tribal involvement in the Border XXI Program. The funds are being used specifically to aid tribes in attending and participating in the nine Border XXI workgroup and subworkgroup meetings. Of that \$170,000, \$65,000 will be allocated to the Tohono O'odham Nation to hire a Border XXI coordinator. The remaining \$105,000 will be given to two California tribes (grants yet to be completed) to support outreach, including the publication of a newsletter, development of a web site, and defrayment of travel costs to attend meetings.
- In 1998, \$30,000 was made available through a grant to defray travel expenses for any tribal representative interested in attending a Border XXI workgroup meeting. The cost of travel was seen as being one of the most formidable impediments to tribal participation.
- The San Diego Border Liaison Office (SDBO) has held two open sessions for tribes to provide participants with: (1) a brief overview of the history of the Border XXI Program and of current activities; (2) information on environmental grants available to border tribes (described below); and (3) an opportunity to exchange information. The first open house, held August 12, 1997 was attended by 31 tribal representatives. At the second open house, held October 2, 1998, 33 tribal representatives from 14 border tribes were in attendance.
- In August 1998, a border tribal outreach coordinator joined the SDBO team. The coordinator is responsible for (1) conducting outreach to border tribes on Border XXI meetings, events, and issues; (2) overseeing grant projects awarded to border tribes; and (3) bridging the relationship between representatives of the border tribes and EPA Region 9.
- In February 1998, EPA sponsored the *Conference of Native American Nations on NAFTA and U.S.-Mexico Border Issues*. Held in San Diego, California, the conference brought together more than 60 federal, state, and tribal representatives to discuss the ongoing border environmental activities of the federal and state agencies, environmental concerns of the border tribes, and funding and mechanisms for tribal involvement in ongoing border activities.

GRANTS TO TRIBES In 1997, EPA Region 9 provided \$25,000 in grant funding to the Inter-Tribal Council of Arizona (ITCA) to assist tribes in addressing environmental issues identified in the 1996 U.S.-Mexico Border XXI Program: Framework Document through the provision of travel and per diem costs. The ITCA will also assist tribal governments in planning and developing policies to address specific environmental conditions precipitated by border activities.

Through the Border Tribal Grant Program, \$17 million was allocated in 1997, and \$5 million was allocated in 1998 in grants for wastewater and drinking-water infrastructure projects. Of the 24 U.S. federally-recognized border tribes in California and Arizona, 14 submitted proposals. All 14 tribes were awarded funding for a total of 26 projects. Four of those projects have been complete and four more are under construction. One project is ready to begin

construction; two projects are under design; six projects are ready to start design; and nine projects are completing the planning phase.

For more information on particular grants awarded to border tribes, please see the chapter of the *U.S.-Mexico Border XXI Program: Progress Report 1996–2000* on the activities of the Water Workgroup.

APPENDIX 10 ENVIRONMENTAL JUSTICE

ENSURING THE U.S. ENVIRONMENTAL PROTECTION AGENCY'S RESPONSIVENESS AND INTEGRATION OF ENVIRONMENTAL Responding to a need to better integrate environmental justice into the Border XXI Program, the U.S. Environmental Protection Agency (EPA) sponsored a roundtable on environmental justice in the border region. The International Subcommittee of the National Environmental Justice Advisory Council (NEJAC) convened the meeting. The purpose of the roundtable was to initiate a dialogue among the diverse environmental justice stakeholders in the border region and to hear firsthand about the concerns and priorities of residents living in the border region.

As a result of the roundtable, EPA has enhanced outreach and increased efforts to better integrate environmental justice into border activities. EPA is also working to develop an environmental justice strategy for the entire border region.

WORKING WITH OTHER FEDERAL AND STATE AGENCIES TO ENCOURAGE INTEGRATION OF ENVIRONMENTAL JUSTICE IN THEIR BORDER PROGRAM

In an effort to encourage coordination between EPA and other federal government agencies working along the U.S.-Mexico border, EPA helped establish the Federal Regional Council Border Committee. The border committee was created specifically to enhance interagency coordination and serve as a venue for helping encourage integration of environmental justice into participating federal agency programs. Currently, only EPA Region 9 (California-Arizona region) has established a border committee; EPA Region 6 (Texas-New Mexico region) is considering the creation of a federal regional council during 2000.

At its monthly meeting on September 15, 1999, the Federal Regional Council Border Committee recommended that several actions be endorsed by the full Federal Regional Council, including: (1) construction of an interagency data base on environment-related border projects and (2) identification of opportunities for conducting outreach and technical assistance to border communities to enhance the information those communities have available to them about the availability of federal grants and programs. The Federal Regional Council Border Committee is supporting the President's Interagency Task Force on the Economic Development of the Southwest Border by creating complementary programs and supporting the task force's objectives and strategies.

REDUCING RISK AND DISPROPORTIONATE ADVERSE ENVIRONMENTAL EXPOSURE TO MINORITY COMMUNITIES IN THE U.S. BORDER REGION

Since a large percentage of the U.S. border area population is considered "minority" and at least 50 percent is considered below the U.S. federal poverty level, many of the projects initiated under the umbrella of the Border XXI Program have served to reduce risk and disproportionate adverse exposure to minority, low-income communities. The largest contribution to that effort has been funds provided to the Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADB) for the construction of water and wastewater and solid waste infrastructure. Many tribal and minority communities have benefited directly from construction of these facilities, and more will benefit in the future.

APPENDIX 11 COORDINATION PRINCIPLES BETWEEN THE BORDER XXI NATIONAL COORDINATORS AND THE U.S. AND MEXICAN BORDER STATES AND U.S. TRIBES FOR THE BORDER XXI PROGRAM

Ensenada, Baja California May 13, 1999

The Border XXI Framework Document of 1996 recognizes that active participation of border states and tribes is central to the implementation of the Border XXI Program.

Under Article 9 of the La Paz Agreement, the Border XXI National Coordinators will implement this document with their respective border states and the United States border tribes, in accordance with the each country's laws and regulations.

In order to implement this document and whereas:

The mission of the Border XXI Program is to achieve a clean environment and protect public health and natural resources in the U.S.-Mexico border region, and the *Border XXI Framework Document* was developed to express certain concepts, goals, and understandings among participating stakeholders;

The environmental directors of the ten border states, during their third annual retreat, submitted a joint proposal to the National Coordinators of the Border XXI Program expressing their opinion on the Program's implementation process and offering recommendations for improving state participation in the Program, including developing systematic, standard organizational procedures to facilitate state participation;

The National Coordinators indicated support for the border states to play a more active role as participants in the Border XXI Program: in Mexico, officials from SEMARNAP and the six Mexican border states met three times, and on July 17, 1998, in Saltillo, Coahuila, agreed to specific procedures for coordination, such as establishing a list of issues to analyse together; in addition, the Mexican National Coordinator provided a written response to the Mexican states on October 13, 1998; in the United States, the Regional Administrator of EPA's Region 6 office, on behalf of the U.S. National Coordinator, addressed the concerns of the U.S. states at the Ten States meeting on October 20, 1998, and subsequently confirmed EPA's response in a letter to the U.S. states on December 7, 1998 (see attachments);

U.S. Indian Tribes are sovereign nations, and all Indian communities in the border area have a long tradition of stewardship of the border region, which calls for their active participation in the Border XXI Program, workgroups, and subworkgroups:

State participation in border environmental programs requires an accelerated process of decentralization of environmental management, and one of the principal objectives of Border XXI is decentralization;

The Signatories recognize the benefits and importance of coordinating their efforts in developing and implementing the Border XXI Program, within their respective jurisdictions;

Therefore, the following principles of coordination are established:

- **1.** The Signatories to these Coordination Protocols are the Border XXI National Coordinators, the participating agencies of the Mexican and U.S. border states and the U.S. border tribes.
- 2. The Signatories agree to actively participate in Border XXI, within their respective jurisdictions, working together to establish goals and objectives, identify activities, and secure the necessary resources to meet those goals, objectives, and activities; agreeing on dates and agendas for important meetings; and reporting and measuring the outcomes of those goals, objectives, and activities.
- **3.** The Signatories, including federal, state, and Tribal representatives, have the same opportunity and responsibility to serve as members of workgroups and co-chairs of subworkgroups.
- **4.** Each Signatory, through Border XXI workgroup and subworkgroup members, shall seek and facilitate meaningful participation of individuals, groups, and communities that have requested an opportunity to participate.
- **5.** To promote progress towards workgroup and subworkgroup objectives, each Signatory, through Border XXI workgroup and subworkgroup members, shall commit to frequent and consistent communication within and between workgroups, and subworkgroups; providing regular updates on critical and pending issues of concern; and appointing contact persons for coordination and communication for the Border XXI workgroups.
- **6.** Recognizing the unique cultural and technical differences in methods of communication that exist among members, the National Coordinators shall provide written translation of pre-meeting documents and simultaneous interpretation in English and Spanish for the annual National Coordinators' Meeting and workgroup meetings; in addition, EPA and SEMARNAP, working together with the states, shall endeavor to provide written translation of pre-meeting documents and simultaneous interpretation during subworkgroup meetings.
- **7.** The Signatories shall ensure that each Border XXI workgroup and subworkgroup meets regularly, with each meeting announced in as timely a fashion as possible (at least one month in advance), and each workgroup and subworkgroup shall have a draft agenda for each meeting distributed to workgroup and/or subworkgroup participants at least two weeks prior to a meeting.
- **8.** EPA and SEMARNAP, the National Coordinators of Border XXI, shall create an email address list of Border XXI contacts.
- **9.** Workgroup and subworkgroup co-chairs shall provide timely notice of meetings; give prompt notice of events and other relevant activities taking place within border communities; provide regular updates

on commitments made during workgroup and subworkgroup meetings; and prepare and distribute meeting minutes and/or summaries.

- 10. The Signatories shall provide to each other and to interested individuals, groups and communities, timely notice of public meetings, workshops, and other relevant events taking place within border communities.
- 11. The Signatories shall work together to identify and secure funds to support travel and per diem expenses of participants as required.
- 12. SEMARNAP and EPA shall announce the time and location of the Border XXI Program National Coordinators Meeting at least two months in advance.

These Coordination Principles do not exclude the participation of other entities in either country.

NATIONAL COORDINATORS:

Samaniego Leyva

ordinadora de Asuntos Internacionales

Dr. William A. Nitze

Assistant Administrator

Office of International Activities

U.S. Environmental Protection Agency

REGIONAL ADMINISTRATORS:

Gregg A. Cooke

Region 6

Region 9

STATE ENVIRONMENTAL AGENCIES:

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Jacqueline E. Schafer

Director

Arizona Department of Environmental Protection

Year 13, 1589

Date

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M.C. Adolfo González Calvillo Director General de Ecología Dirección General de Ecología Ally

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CALIFORNIA

Winston H. Hickox

Secretary for Environmental Protection California Environmental Protection Agency 5/15/49

Date

CHIHUAHUA

Ing. José Antonio Cervantes Gurrola

Director de Ecología

Secretaría de Desarrollo Urbano y Ecología

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Dr. Rodolfo Garza Gutiérrez Director General de Ecología Secretaría de Desarrollo Social Pecha 79

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Peter Maggiore Cabinet Secretary

New Mexico Environmental Department

6/25/99

NUEVO LEÓN

Ing. Julian de la Garza Castro Subsecretario

Subsecretaría de Ecología

SONORA

Arq. Luisa María Gutiérrez Directora de Ecología Dirección de Normatividad Ecológica

TAMAULIPAS

Ing. Jorge Fernández Villareal Director General Recursos Naturales y Medio Ambiente Secretaría de Desarrollo Urbano y Ecología

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TEXAS

R.B. "Ralph" Marquez Commissioner

Texas Natural Resource Conservation Commission

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UNITED STATES TRIBES
AGUA CALIENTE
BARONA
BARO-LONG
CAHUILLA
CAMPO
COCOPAH
CUYAPAIPE
INAJA AND COSMIT
J A M U L
KICKAPOO
LA JOLLA
LA POSTA
LOS COYOTES
MANZANITA
MESA GRANDE
PALA
PAUMA
PASCUA YAQUI
PECHANGA
QUECHAN
RAMONA
RINCON
SAN PASQUAL
SANTA YSABEL
SYCUAN
TOHONO O'ODHAM
TORRES-MARTINEZ
VIEJAS
YSLETA DEL SUR PUEBLO

APPENDIX 12 CLEAN WATER IN HOMES IN BORDER AREA MUNICIPALITIES PROGRAM OJINAGA, CHIHUAHUA

Following is a summary report on the Clean Water in Homes in Border Municipalities Program, the full results of which are available from the agencies that operate the project. A list of program contacts is provided at the end of this summary.

The Clean Water in Homes Program was initiated in April 1991, at the request of the Mexican government, to provide clean water to all of the country's communities. Based on the definition of minimum standards of quality, wastewater treatment, and disposal, the program works to guarantee a volume and quality of water suitable for different uses: human consumption, agricultural irrigation, and industrial and recreational use. The Comisión Nacional del Agua (CNA, or National Water Commission and the Secretaría de Salud (SSA, or Secretariat of Health jointly participate in the implementation and development of the program.

The program succeeded in substantially reducing the incidence of gastrointestinal illnesses, particularly cholera, in Mexico. A gradual decrease in reported incidences of cholera was achieved over time, from 16,430 cases in 1995 to 2,359 cases in 1997, and only 9 cases confirmed in 1999.

In 1997, the CNA and the SSA implemented the Clean Water Program in the states of Chiapas, Oaxaca, and Yucatan to avoid a resurgence of gastrointestinal illnesses. In highly impoverished areas, cases of cholera and elevated mortality rates as a result of diarrhea-related illnesses were being reported.

CLEAN WATER IN HOMES IN BORDER MUNICIPALITIES PROGRA

The Clean Water in Homes in Border Municipalities
Program came about as a proposal put forth by the Water and Environmental Health workgroups of the U.S. Border XXI Program. The proposal gained the support of the National Coordinators of that program at their binational meeting in San Diego, California in March 1998.

The Clean Water in Homes in Border Municipalities Program began in July 1998 in the state of Chihuahua. The agencies jointly participating in the program are the main offices and state-level offices of the SSA, the Secretaría del Medio Ambiente, Recursos Naturales, y Pesca, (SEMARNAP, or Secretariat of Environment, Natural Resources, and Fisheries), CNA, the Fundación de México-Estados Unidos para la Ciencia, (FUMEC, or Mexico-United States Foundation for Science) at the state and municipal authority level, and community representatives. The North American Development Bank (NADB) also participates in the program.

The program is similar to that of the Clean Water Program. It focuses on basic sanitation and environmental education in border-area municipalities in Mexico. In particular, the program targets municipalities characterized by rural communities with elevated mortality indices related to gastrointestinal illnesses. The program also focuses on municipalities with deficient or nonexistent water supply and basic sanitation infrastructure. In addition, the program considers municipalities that have no short-term plans to provide funds for the creation of infrastructure to alleviate such problems.

OVERALL OBJECTIVE The overall objective of the program is to reduce morbidity and mortality indices attributable to gastrointestinal infections in the northern border area of Mexico through: (1) improvement of water quality (both at the level of water supply systems and at the residential level); (2) sanitary protection of water sources; (3) promotion of disinfecting techniques; (4) promotion of appropriate waste disposal techniques; (5) promotion of the hygienic handling of food; (6) conduct of community discussions; and (7) application of simple actions to foster basic sanitation in schools.

STRATEGIES

- Through the use of a family questionnaire, evaluate practices and attitudes of the population in relation to basic sanitation.
- Gather drinking water samples to determine bacteriological quality.
- Promote basic sanitation practices in communities and schools by holding discussion sessions, showing the video series "Los Consejos de Doña Lupita" and distributing brochures. 1
- Promote the use of potable water disinfecting techniques, supported by the distribution of bottles of colloidal silver to households.
- Through the use of surveys, determine awareness of colloidal silver as a household water disinfectant.
- Evaluate sanitary water supply sources and systems.
- Evaluate waste and wastewater disposal sites.
- Examine water quality through the physicochemical and bacteriological characterization of water to be used for human consumption.
- Develop an integral, basic sanitation diagnosis for communities, including proposed solutions to specific sanitation problems.
- Evaluate the program's effectiveness.

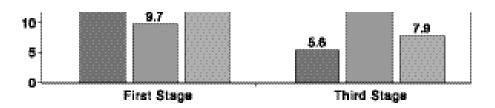
DEVELOPMENT To date, three stages of the program have been completed. During the first stage (August 31-September 5, 1998), the program was implemented. During the second stage (April 19-23, 1999), the program's efficiency was evaluated with respect to the use of colloidal silver as a household water disinfectant. The third stage (September 27-30, 1999) was carried out to determine the impact of the activities that had been undertaken.

Throughout each stage, an average of 976 families (3,477 inhabitants) benefited directly from the application of the program. However, interaction between rural and urban populations allowed extension of the program's benefits to the municipality of Ojinaga's total population of 20,100.

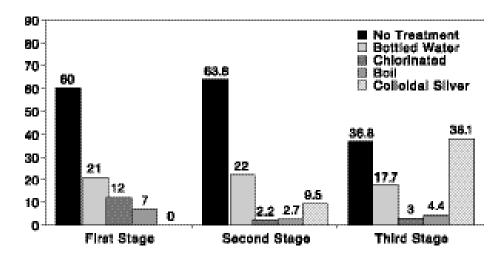
Los Consejos de Doña Lupita is a series of 12 videos, each 3 minutes long to promote essential aspects of basic sanitation.

Following are the results of the surveys conducted in both rural locales and urban neighborhoods during the first and third stages of the program:

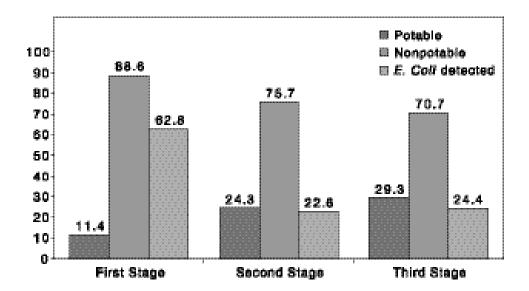
1. A 6 percent reduction in reported cases of diarrhea-related illnesses. This figure will be validated when local statistics and the official annual morbidity rates from the SSA are published.



2. A 27 percent increase in the practice of disinfecting potable water with colloidal silver as the most commonly used method (38 percent in the third stage).



- 3. A 31 percent increase in the practice of disinfecting raw vegetables.
- 4. An 18 percent increase in the amount of produce fit for human consumption.



The most significant changes occurred in rural areas. In the initial stages of the program, overall coliform was detected in 100 percent of the samples requested, while *E. coli.* was detected in 78 percent of the samples. More recently, in the third stage, overall coliform was detected in 82 percent of the samples, and *E. coli.* in only 37 percent of the samples.

The program effectively educated both the population and municipal and state authorities on the importance of basic sanitation as a health benefit. As a result of funding, certain infrastructure projects accelerated: (1) sanitary land-fill operations began in the city of Ojinaga, Chihuahua; (2) a detailed design was prepared for a wastewater treatment plant; and (3) the oxidation basin was enlarged to prevent and control water contamination. In addition, the water supply systems for Barrio de los Montoya and Valverde were renovated; a new system, now in operation, was built for La Colmena; and a sewage program was implemented in Valverde.

In each stage of the program, pertinent recommendations were made to the municipal authorities and local water officials in the various areas visited. The immediate recommendations to the proper authorities demonstrate the potential success of the program before it is completed.

México-Estados Unidos para la Ciencia, (FUMEC, or Mexico-United States Foundation for Science). The surveys were carried out in four stages to identify the conditions related to the population's basic sanitation (water service, management of potable water, knowledge about disinfectants for water and vegetables, disposal of excreta, and the incidence of diarrhea-related illnesses). The results coincided with the results of a survey taken by the program's operating personnel.

The most notable results, according to the verbal information furnished by the population interviewed between the first and the fourth survey stages, were:

- 1. In general terms, it can be said that the incidence of gastrointestinal illnesses dropped from 21 percent (before the program's implementation) to 6 percent, as of the fourth survey stage.
- 2. With respect to the population's knowledge about water disinfectants, 41 percent of the population said they knew about some disinfectant before the program's implementation, while that proportion increased by 15 percent by the time of the last evaluation.
- 3. In relation to persons practicing water disinfection, a general increase of 20 percent was observed between the evaluation made before implementation of the program and the fourth evaluation.

CONCLUSIONS During its short test period, the Clean Water in Homes in Border Area Municipalities program proved to be an effective instrument for reducing gastrointestinal illness indices among the population, through integral sanitation actions and health education.

Satisfactory results were achieved in a short time and at relatively low cost by (1) addressing issues dealing with potable water and food disinfection, (2) promoting awareness of basic sanitation, and (3) making an effort to heighten consciousness of these matters among municipal authorities.

The program also demonstrated the merits of inter-institutional cooperation among the various agencies in all levels of Mexico's government, as well as with private foundations and financial institutions.

The information presented above demonstrates the program's feasibility as an instrument in meeting sanitation needs in disadvantaged communities in the Mexican border region, especially in rural communities. It is, therefore, reasonable to suggest that the program be established as a continuing and committed project in a new Border XXI phase starting in 2001. Doing so will allow extension of the program to other communities in Mexico's border region.

APPENDIX 13 NON-BINATIONAL BORDER ACTIVITIES - MEXICO

Mexico's Comisíon Nacional de Agua (CNA, or National Water Commission) has developed potable water, sewer, and sanitation services master plans for Ensenada, Tecate, Mexicali, Puerto Peñasco, Nogales, Piedras Negras, Acuña, Matamoros, Reynosa, and Nuevo Laredo.

Digital cartography was prepared for the cities of Mexicali, San Luis Río Colorado, Naco, Agua Prieta, Cananea, Santa Ana, Magdalena de Kino, and Imuris and part of the Santa Cruz River, Ojinaga, Nueva Ciudad Guerrero, Mier, Miguel Alemán, Valle Hermoso, Camargo, Díaz Ordaz, and Nuevo Progreso.

Information from surveying and mapping studies of hydraulic networks was integrated into geographic information systems for the cities of Santa Ana, Magdalena de Kino, and Imuris, as well as Ojinaga, Nueva Ciudad Guerrero, Miguel Alemán, and Mier.

In Ensenada, with support from federal government through the CNA, the state government of Baja California and the state Public Services Commission developed a matrix of sanitation projects, including a new wastewater treatment plant, *El Naranjo*. Ensenada now has the capacity to treat 100 percent of its wastewater.

The Immediate Works Program in Tamaulipas and Coahuila consisted of the rehabilitation of potable water and sewer systems.

APPENDIX 14
SURFACE WATER QUALITY MAPS

